REPORT NUMBER: 301-MGA-2008-003

SAFETY COMPLIANCE TESTING FOR FMVSS 301R
FUEL SYSTEM INTEGRITY – REAR IMPACT

GENERAL MOTORS CORPORATION
2008 HUMMER H3
NHTSA NUMBER: C80103

PREPARED BY:
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BURLINGTON, WI 53105

Test Date: September 12, 2008

Final Report Date: September 24, 2008

FINAL REPORT

PREPARED FOR:
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ENFORCEMENT
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COTR, Rear Impact

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Technical Report Documentation Page

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16. Abstract A rear impact was conducted on a 2008 Hummer H3 at MGA Research Corporation on September 12, 2008. This test was conducted to obtain data indicant of FMVSS 301R. The impact velocity was 79.8 km/h. The ambient temperature at the time of impact was 22 degrees Celsius.			
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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This rear impact test is sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-06-C-00030. The purpose of this test is to reduce deaths and injuries occurring from fires that result from fuel spillage during and after motor vehicle crashes and resulting from ingestion of fuels during siphoning.

SUMMARY

A 2008 Hummer H3 was impacted by a Moving Deformable Barrier (MDB) at a velocity of 79.8 km/h. The test was performed at MGA Research Corporation on September 12, 2008. Pre-and post-test photographs of the vehicle and dummies can be found in Appendix A.

One real-time camera and three high-speed cameras were used to document the impact event.

- Left Rear Half 500 fps
- Right Rear Half 500 fps
- Overhead Overall 500 fps
- Real Time Pan 24 fps

Two ballast Part 572E, 50th percentile male anthropomorphic test devices (ATDs) were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

There was no Stoddard Solvent leakage after the event or during any phase of the static rollover.

The vehicle appeared to comply with all the requirements of FMVSS No. 301 “Fuel System Integrity.”

SECTION 2

DATA SHEETS

DATA SHEET NO. 1

TEST VEHICLE SPECIFICATIONS

Test Vehicle: 2008 Hummer H3 NHTSA No.: C80103
Test Program: FMVSS 301 Fuel System Integrity Test Date: 9/12/2008

TEST VEHICLE INFORMATION

Manufacturer	General Motors
Model	Hummer H3
Body Style	MPV 4 Door
Major Options	Dynamic Stability Control
NHTSA No.	C80103
VIN	5GTEN13EX88110807
Color	Victory Red
Delivery Date	9/9/2008
Odometer Reading (mile)	553
Dealer	Hummer of Columbus
Transmission	Automatic Overdrive
Final Drive	Four Wheel Drive
Number of Cylinders	5
Engine Displacement (L)	3.7
Engine Placement	Longitudinal

DATA FROM VEHICLE'S CERTIFICATION LABEL

Manufactured By	General Motors Corporation
Date of Manufacture	07/07

GVWR (kg)	2722
GAWR Front (kg)	1384
GAWR Rear (kg)	1542

VEHICLE CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench		
Number of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				544
Number of Occupants x 68 kg.				340.2
Cargo Wt. (RCLW) (kg)				203.8

DATA SHEET NO. 1 (continued)

TEST VEHICLE SPECIFICATIONS

Test Vehicle:	2008 Hummer H3	NHTSA No.:	C80103
Test Program:	FMVSS 301 Fuel System Integrity	Test Date:	9/12/2008

DATA FROM VEHICLE'S TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	210	210
Recommended Tire Size	P265/75R16	P265/75R16
Recommended Load Range	Not Listed	Not Listed
Tire Size on Vehicle	P265/75R16	P265/75R16
Tire Manufacturer	Goodyear	Goodyear
Location of Placard of Vehicle	Left Front Door Jam	
Type of Spare Tire (full size/space saver)	Full Size	

DATA SHEET NO. 2

PRE-TEST DATA

Test Vehicle: 2008 Hummer H3 NHTSA No.: C80103
Test Program: FMVSS 301 Fuel System Integrity Test Date: 9/12/2008

WEIGHT OF TEST VEHICLE

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	555.7	545.7		633.2	612.8	
Right	kg	536.2	516.2		601.0	583.8	
Ratio	%	50.7	49.3		50.8	49.2	
Totals	kg	1091.9	1061.9	2153.8	1234.2	1196.6	2430.8

CALCULATION OF TARGET TEST WEIGHT (TTW)

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2153.8
Rated Cargo/Luggage Weight (RCLW)	kg	136.1
Weight of 2 P572E ATDs	kg	148
Calculated Vehicle Target Weight (TVTW)	kg	2437.9

Vehicle Wheelbase	2843 mm
Weight of Ballast secured in rear seat	120.2 kg
Method of Securing Ballast	Straps
Vehicle Components Removed for Weight Reduction	None

VEHICLE ATTITUDES

	Units	LF	RF	LR	RR
As Delivered	mm	921	928	997	1005
As Tested	mm	895	900	978	988

DATA SHEET NO. 2 (continued)

PRE-TEST DATA

Test Vehicle: 2008 Hummer H3 NHTSA No.: C80103
Test Program: FMVSS 301 Fuel System Integrity Test Date: 9/12/2008

FUEL SYSTEM DATA

	Units: Liters
Usable Capacity of "Standard Tank" (Owner's Manual)	87.3
Usable Capacity Figure Furnished by COTR	87.3
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	80.3 to 82.0
Actual Test Volume (entire fuel system filled)	81.4

Test Fluid Type	Stoddard Solvent
Test Fluid Kinematic Viscosity (centistokes)	2.1 cSt @ 20° C
Test Fluid Color	Purple
Type of Vehicle Fuel Pump	Electrical
Activate Electric Fuel Pump Operation with Ignition Switch ON, but Engine OFF	Yes

Comments (noticeable attributes of fuel system components, capacity, etc.)	None

DATA SHEET NO. 3

MOVING BARRIER DATA

Test Vehicle: 2008 Hummer H3 NHTSA No.: C80103
Test Program: FMVSS 301 Fuel System Integrity Test Date: 9/12/2008

MOVING BARRIER'S TEST WEIGHT

	Units	Front	Rear	Total
Left	kg	374.2	308.8	
Right	kg	389.5	291.2	
Ratio	%	56.0	44.0	
Totals	kg	763.7	600.0	1363.7

Tires (Mfr, line, size)	Yokohamma
Tire Pressure (kPa)	207
Brake Abort System (Yes/No)?	Yes
Date of Last Calibration	8/6/2008

DATA SHEET NO. 4

POST-TEST DATA

Test Vehicle: 2008 Hummer H3 NHTSA No.: C80103
Test Program: FMVSS 301 Fuel System Integrity Test Date: 9/12/2008

IMPACT VELOCITY

	Units: km/h
Required Impact Velocity	80.0
Actual Impact Velocity (Trap No. 1)	79.8
Actual Impact Velocity (Trap No. 2)	79.8
Average Impact Speed	79.8

Temperature at Time of Impact (°C)	22
Test Time	4:10 pm

WELDING ROD IMPACT POINT

	Units: mm
Vertical distance from target center (+ above target / - below target)	2 mm above
Horizontal distance from target center (+ to the right / - to the left)	14 mm to the right

DATA SHEET NO. 5

STATIC ROLLOVER TEST DATA

Test Vehicle:	2008 Hummer H3	NHTSA No.:	C80103
Test Program:	FMVSS 301 Fuel System Integrity	Test Date:	9/12/2008

STODDARD SOLVENT SPILLAGE MEASUREMENT

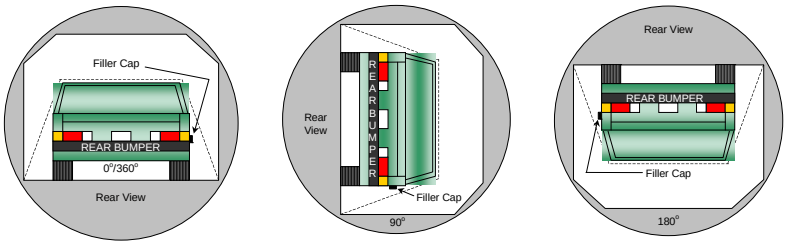
A. From impact until vehicle motion ceases: 0 g
(Maximum Allowable = 28 grams)

B. For the 5 minute period after motion ceases: 0 g
(Maximum Allowable = 28 grams)

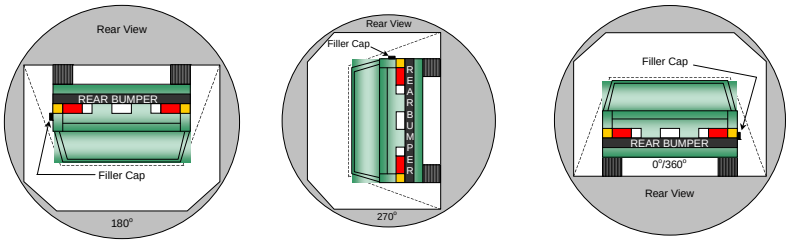
C. For the following 25 minutes: 0 g
(Maximum Allowable = 28 grams/minute)

D. Spillage: **None**

FMVSS 301 STATIC ROLLOVER DATA



0° to 90° 90° to 180°



180° to 270° 270° to 360°

1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.

2. The position hold time at each position is 300 seconds (minimum).

3. Details of Stoddard Solvent spillage locations: **Not Applicable**

DATA SHEET NO. 5 (continued)

STATIC ROLLOVER TEST DATA

Test Vehicle: 2008 Hummer H3 NHTSA No.: C80103
Test Program: FMVSS 301 Fuel System Integrity Test Date: 9/12/2008

STODDARD SOLVENT SPILLAGE MEASUREMENT
Hold Time = 5 minutes at all intervals

0° TO 90° Rotation Time (sec) = 119 sec

Test Phase	Spillage (g)	Spillage Details
First 5 minutes from onset of rotation	0	
Sixth minute from onset of rotation	0	
Seventh minute from onset of rotation	0	
Eight minute if required	N/A	

90° TO 180° Rotation Time (sec) = 117 sec

Test Phase	Spillage (g)	Spillage Details
First 5 minutes from onset of rotation	0	
Sixth minute from onset of rotation	0	
Seventh minute from onset of rotation	0	
Eight minute if required	N/A	

180° TO 270° Rotation Time (sec) = 119 sec

Test Phase	Spillage (g)	Spillage Details
First 5 minutes from onset of rotation	0	
Sixth minute from onset of rotation	0	
Seventh minute from onset of rotation	0	
Eight minute if required	N/A	

270° TO 360° Rotation Time (sec) = 121 sec

Test Phase	Spillage (g)	Spillage Details
First 5 minutes from onset of rotation	0	
Sixth minute from onset of rotation	0	
Seventh minute from onset of rotation	0	
Eight minute if required	N/A	

FORM 1

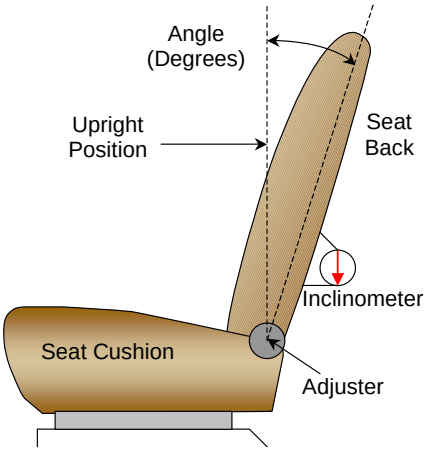
TEST VEHICLE INFORMATION

Test Vehicle:	2008 Hummer H3	NHTSA No.:	C80103
Test Program:	FMVSS 301 Fuel System Integrity	Test Date:	9/12/2008

NORMAL DESIGN RIDING POSITION

For both driver and passenger seat backs:

Remove the black plastic seat back cover. This will allow access to the seat frame. Starting approximately 18-20 inches above the seat back pivot point near the outboard edge, press against the seat back rear surface to feel for a hard structure (i.e. steel frame). Make sure that there is enough flat surface on the frame to correctly position the inclinometer. Place the inclinometer firmly on the frame and adjust the seat back until the correct angle is indicated. Measure without the ATD in the seat and again with the ATD in the seat and adjust to achieve 23 degrees. Reinstall black plastic seat back cover. See attached directions for removal and installation of back panel.



FRONT SEAT ASSEMBLY

Driver Seat Back Angle	23°
Passenger Seat Back Angle	23°

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	240 mm	120 mm
Passenger Seat	240 mm	120 mm

D-RING ADJUSTMENT

The driver D-ring was full up and the passenger D-ring was full down.

STEERING COLUMN ADJUSTMENT

The steering column was placed in the mid position.

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

A-1.

Vehicle's Certification Label

A-2.

Vehicle's Tire Placard

Pre-Test Front View of Vehicle

Post-Test Front View of Vehicle

Pre-Test Left Side View of Vehicle

Post-Test Left Side View of Vehicle

Pre-Test Left Rear Closeup View of Vehicle

Post-Test Left Rear Closeup View of Vehicle

Pre-Test Right Side View of Vehicle

Post-Test Right Side View of Vehicle

Pre-Test Rear View of Vehicle

Post-Test Rear View of Vehicle

Pre-Test ¾ Frontal View From Right Side of Vehicle

Post-Test ¾ Frontal View From Right Side of Vehicle

Pre-Test ¾ Rear View From Left Side of Vehicle

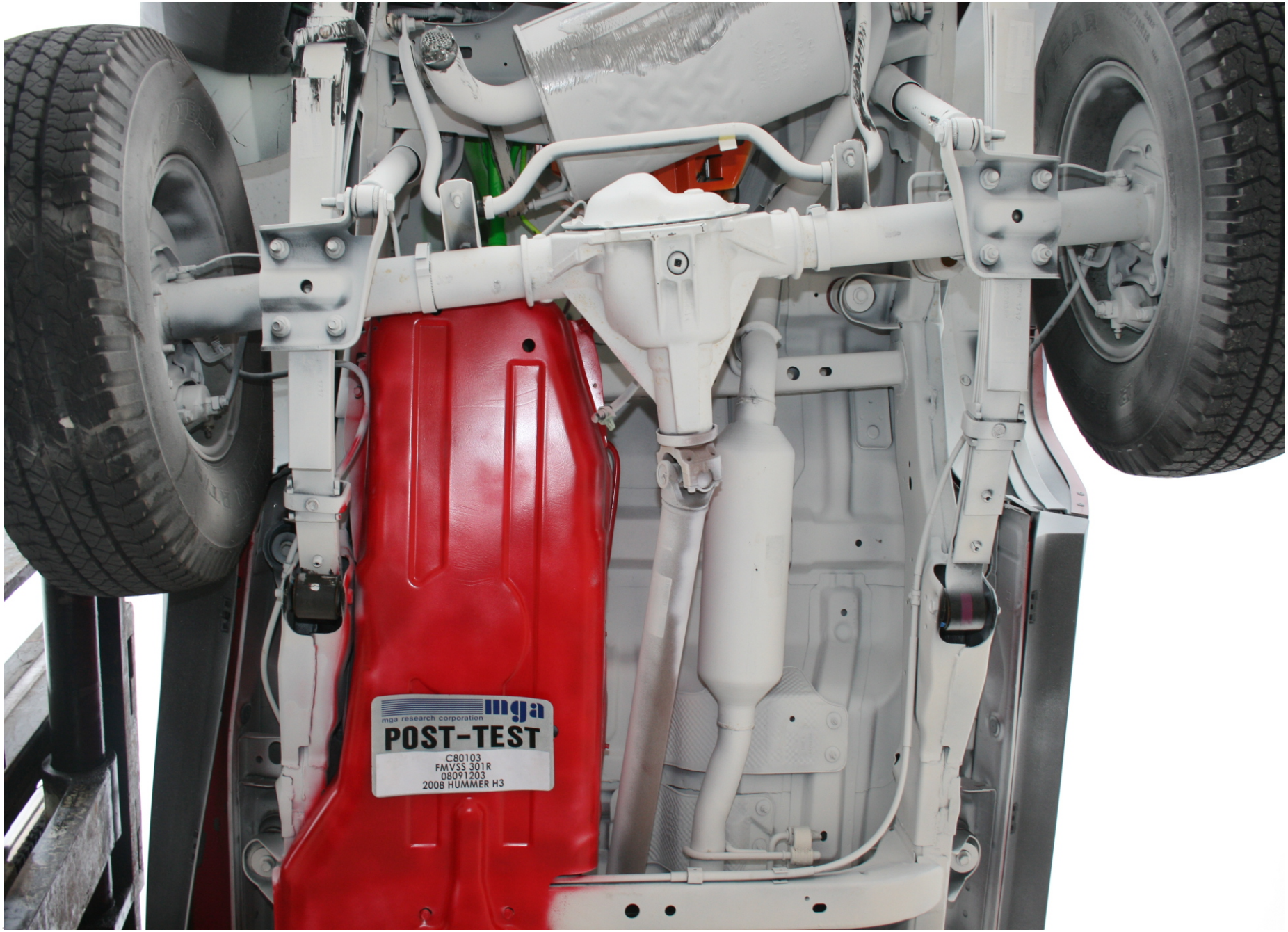
Post-Test ¾ Rear View From Left Side of Vehicle

Pre-Test Impact Point

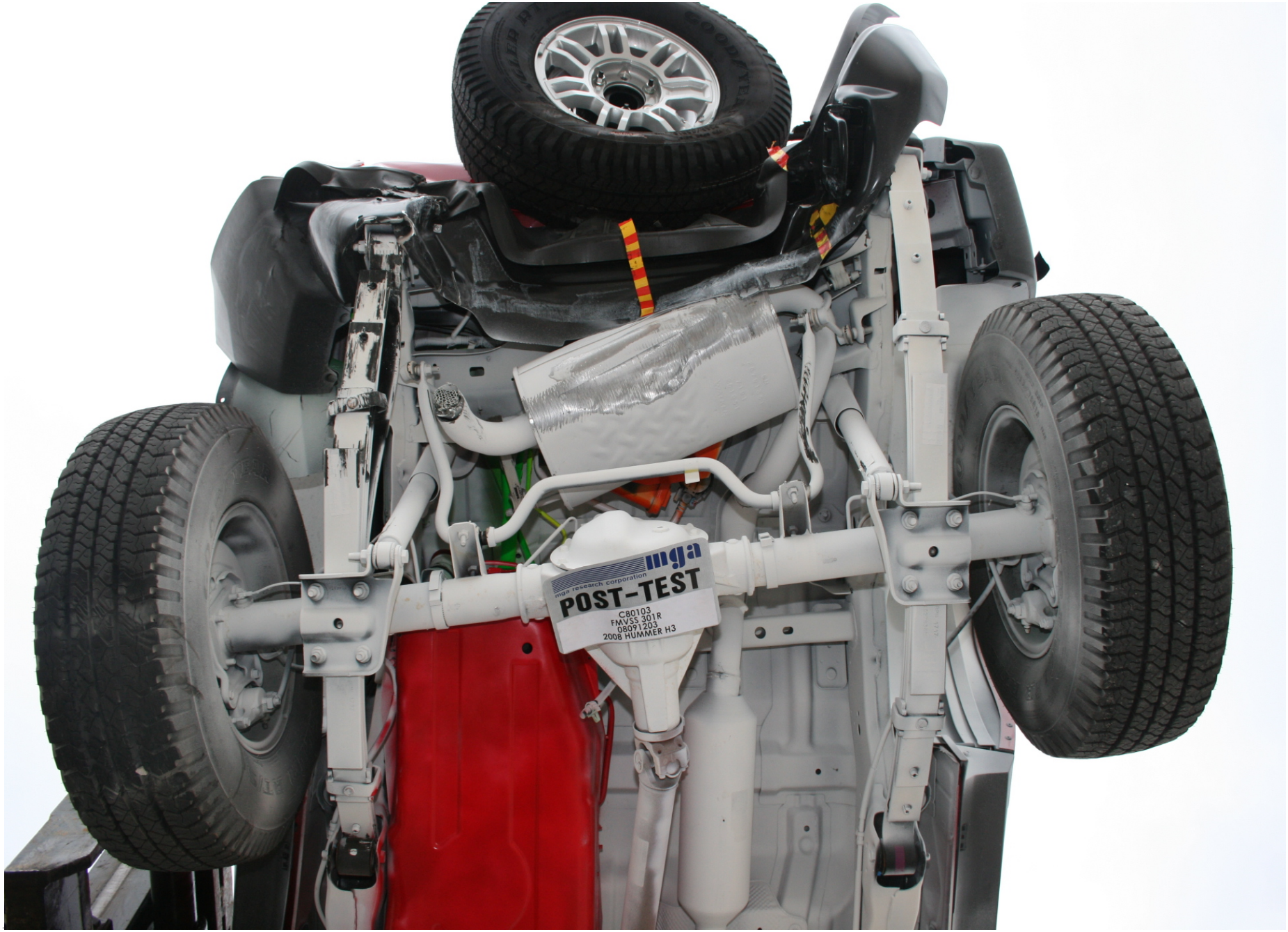
Post-Test Impact Point

Post-Test Underbody View 1

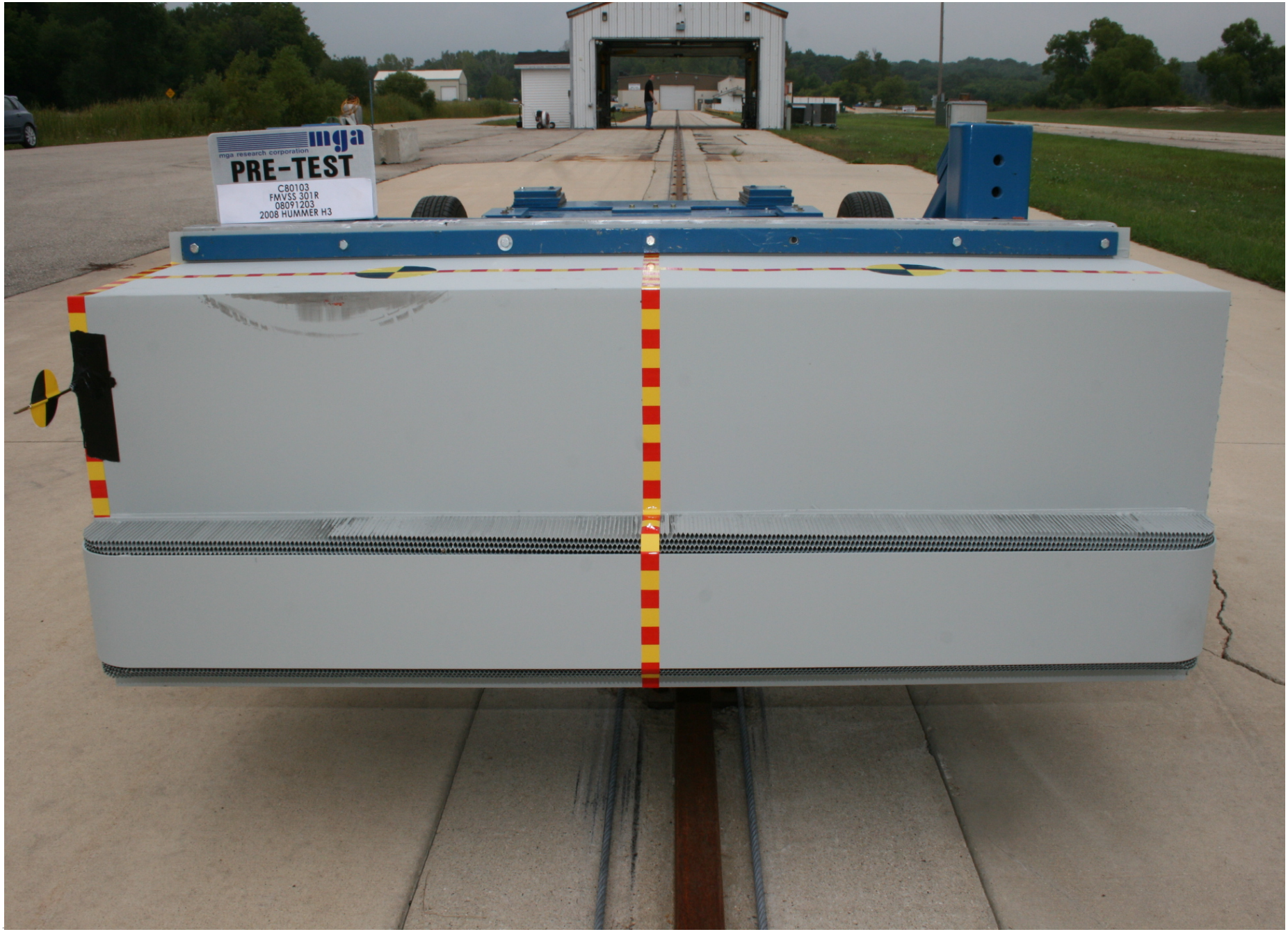
Post-Test Underbody View 2



Post-Test Underbody View 3

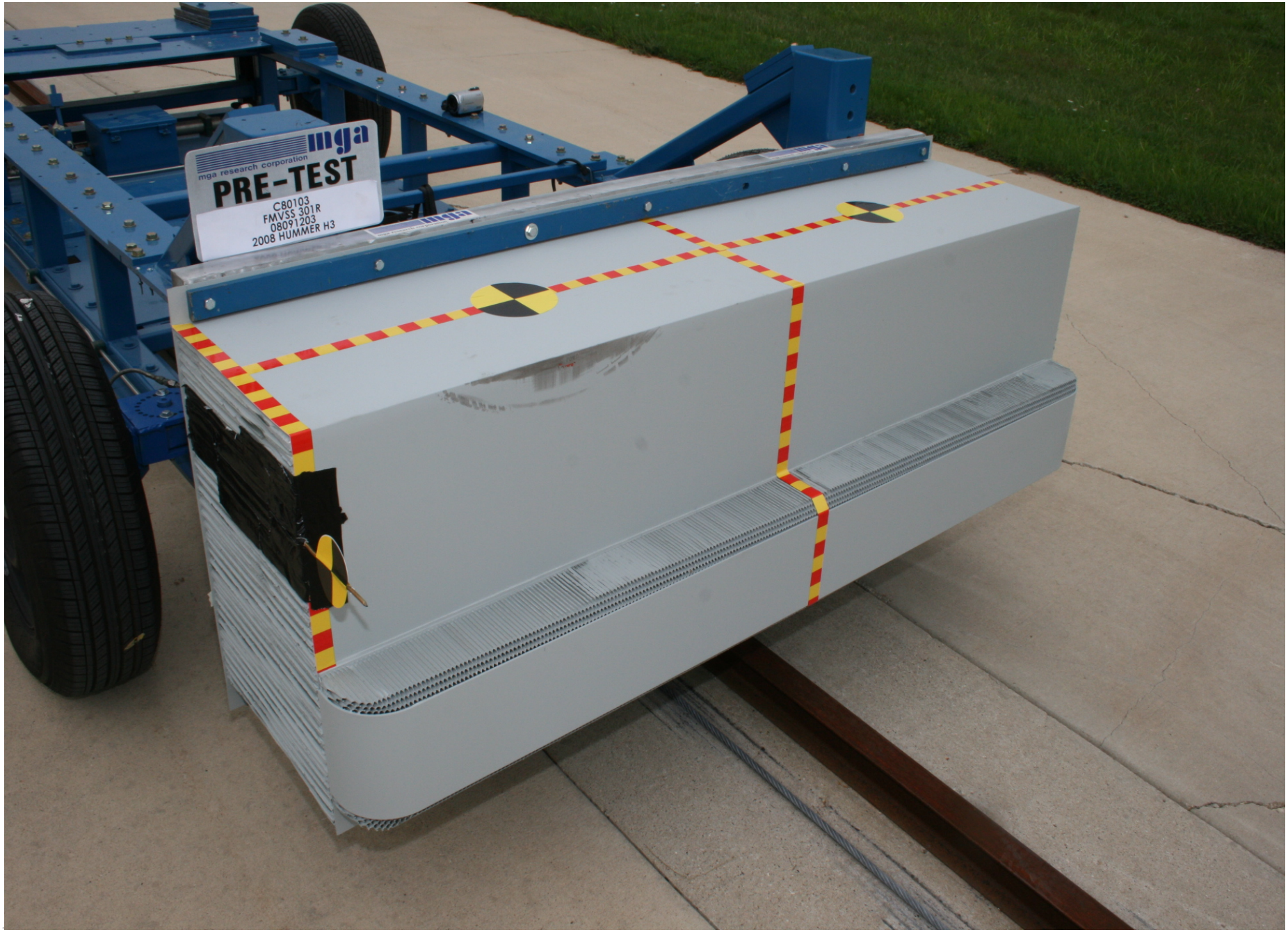


Post-Test Underbody View 4



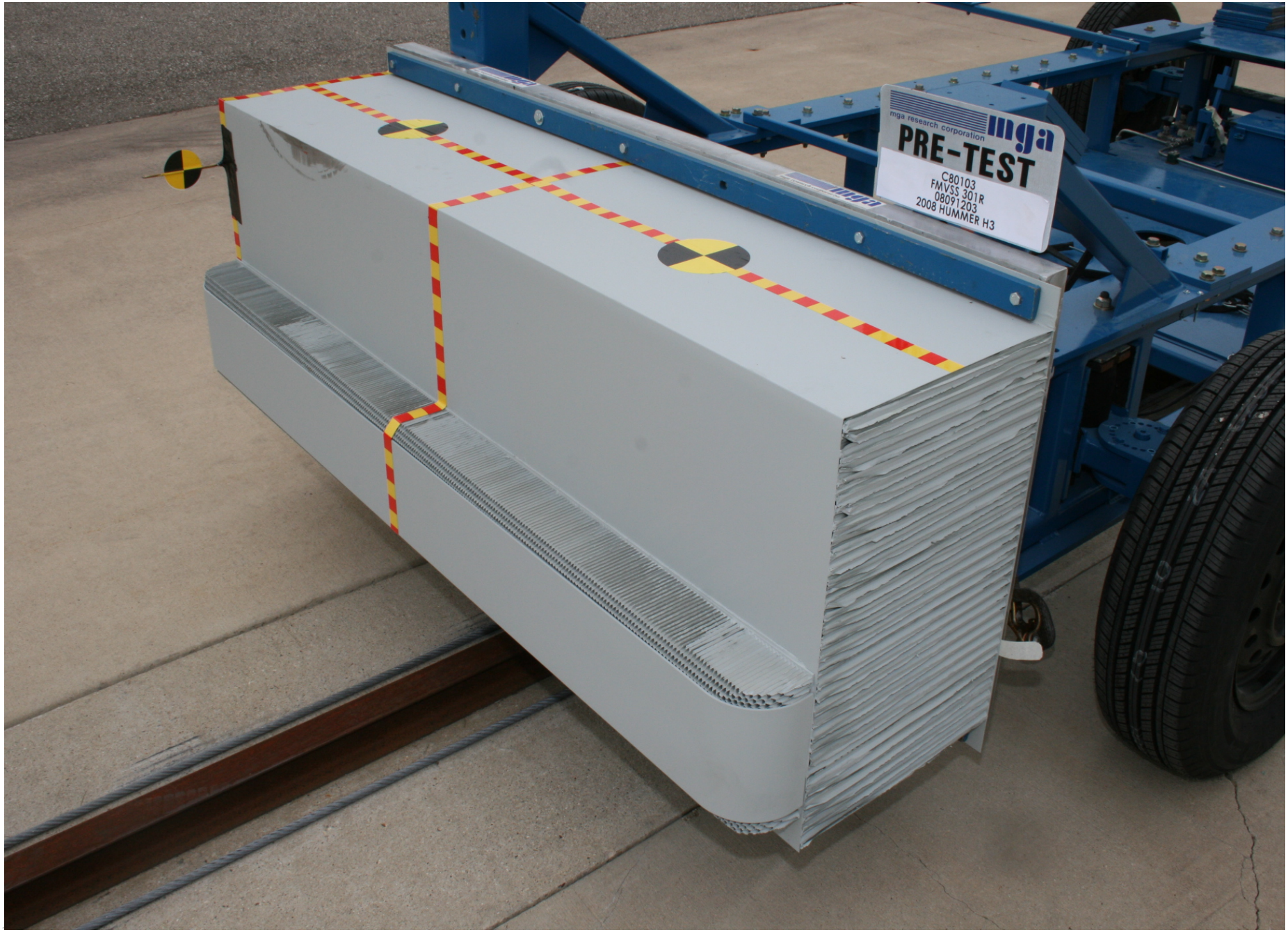
Pre-Test Front View of MDB

Post-Test Front View of MDB



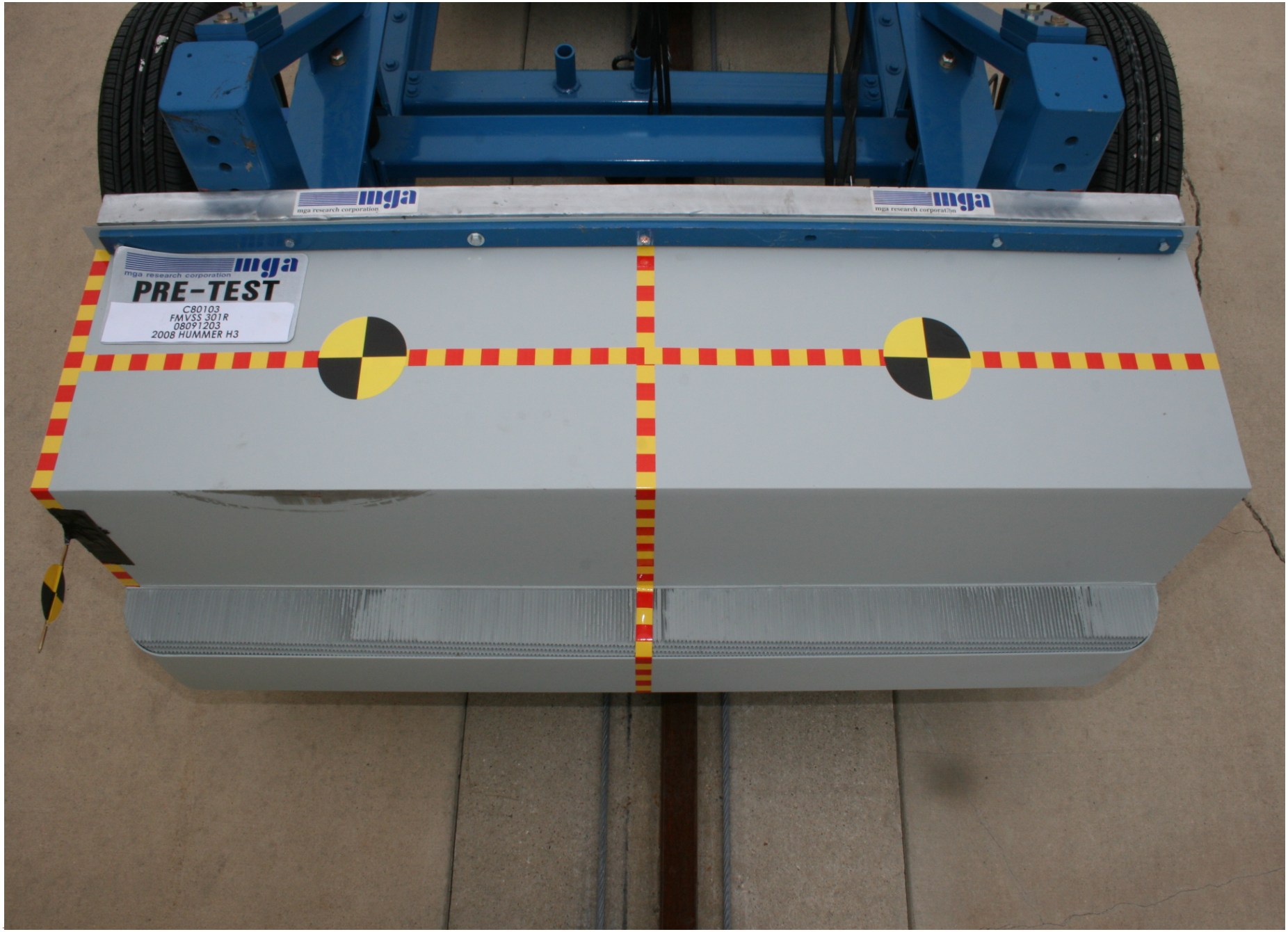
Pre-Test ¾ Right Side View of MDB

Post-Test ¾ Right Side View of MDB

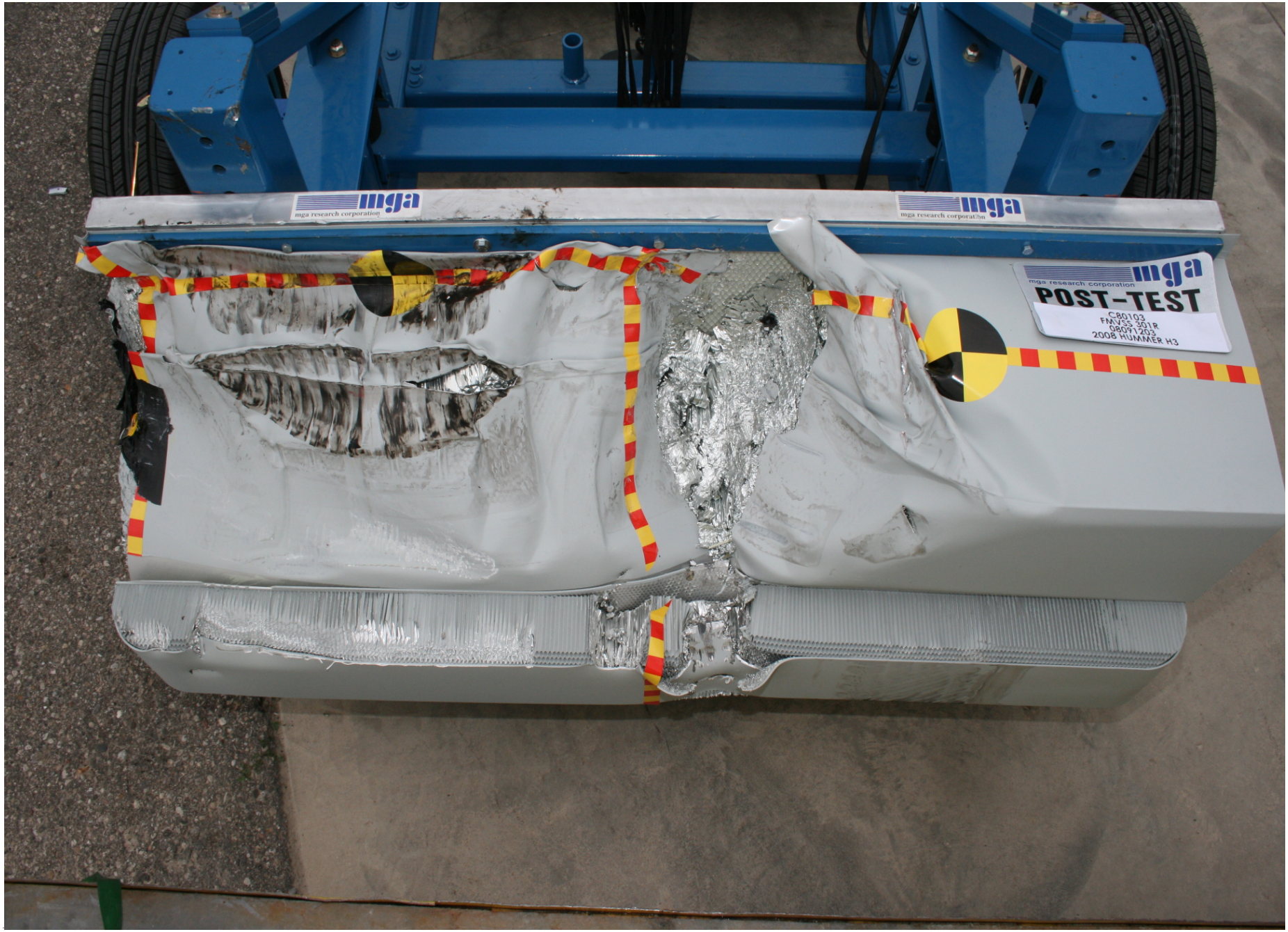


Pre-Test ¾ Left Side View of MDB

Post-Test ¾ Left Side View of MDB



Pre-Test Top View of MDB



Post-Test Top View of MDB

Static Rollover at 90 Degrees

Static Rollover at 180 Degrees

Static Rollover at 270 Degrees

Static Rollover at 360 Degrees